Increasing the Accessibility of a Conventional Cooking Range for Wheelchair Users

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Wheelchair users often have difficulty cooking with a conventional freestanding cooking range, in part because the 36-in. high working surface is too high for them. Barrier-free standards suggest a working surface height of 28 in. to 34 in. (710-865 mm) for wheelchair users (American National Standards Institute, 1986; Canadian Standards Association, 1990; Mace, 1991). The problems experienced when using a conventional cooking range include difficulty with moving pots, danger of burns due to poor clearance of arms over elements (especially when controls are located at the back), difficulty with checking the progress of cooking food because the rims of pots are above eye level, and inability to stir the contents of pots (Hale, 1979). Some solutions that have been used are improving the visual access by installing an angled mirror over the stove top, installing a motor-driven adjustable height counter with an integrated cooktop (Mace, 1991), and using electric mobility devices that allow for positional adjustment of the seated person.

As part of a living laboratory project examining technology's role in improving the quality of life of elderly persons living in the community, we conducted a home visit that resulted in the development of a modification of existing electric cooking ranges to improve accessibility. The visit was to the home of a 72-year-old woman with multiple sclerosis and severe chronic obstructive lung disease. She is nonambulatory, has paraparesis, and has limited active trunk control in sitting. Her upper extremity function is limited by weakness and the range of one shoulder is further limited (shoulder flexion and abduction are less than 90°) by a torn rotator cuff. A home care worker or visiting nurse assists the client in the morning to rise, conduct bowel and bladder routines, wash, dress, and transfer to a powered wheelchair. She functions independently until evening when an attendant prepares and transfers her to bed.

The client lives alone in a single-story bungalow that was modified on the outside to allow access by a porch lift and on the inside to allow passage of her narrow powered chair through some of the internal doorways. To allow her to prepare light meals during the day, her son made several modifications to the kitchen, including lowering the counter to a height of 31 in. The cooking range, however, remained at a height of 36 in.

The client used the range for cooking and occasionally used the oven for baking when she had assistance with turning the oven on and putting in and removing the food. She was unable to easily lift pots or pans onto the cooking elements or to stir and observe the contents of the pots. The controls for the oven and the elements were at the back of the range. She was able to reach the controls for the left elements because of the space between the cooking range and the basement door. She preferred to use the front right burner because the pan or kettle could be moved across the range top and onto the...
counter, which was next to the stove. Her financial situation could not support the purchase and installation of separate countertop range and oven units. The client did not consistently use any reaching devices. Occasionally, she used a dish cloth wrapped over the end of tongs to reach the element controls at the back of the range. However, this approach was risky because her arm clearance over the stove top was poor, thus she risked knocking hot material onto herself or setting her clothing on fire.

Our objective was to reduce the cooking range height to the height of the adjacent counter. This reduction would increase the utility of the cooking elements and reduce the risk of fire and other reaching hazards while retaining the appearance, function, and electrical safety of the cooking range.

Modification of Cooking Range

A large manufacturer of appliances was consulted about the effect of the height reduction on electrical safety and cooking range function; no contraindications to our planned modification were found. Although this modification would invalidate a typical warranty on a new stove, we thought that it would be considered by clients who wanted to modify their current cooking range but could not afford a new appliance, separate cooktop and oven, or major kitchen renovations.

The stove modification was performed in a machine shop, but the task is likely to be within the capabilities of an experienced volunteer in the home, if noise and mess are not issues. Modification took 1 day to complete, including time for removal from the home and reinstallation. A sabre saw was used to cut approximately 3½ in. off the bottom of the stove. A J-roll was then made at the bottom edge by clamping a square bar to it and hammering the metal around the bar, producing a further reduction of approximately 1½ in. (see Figure 1). The corners were cut before the J-roll was bent. The levelling screws were reinstalled with sheet metal nuts. The fabrication of the J-roll tends to damage the stove finish at the bottom, resulting in scuffs and indents.

**Figure 1.** Reduced height cooking range. The stove is cut through line AA. After the panels are bent into a J-roll (see detail), the base of the stove is reduced to the level indicated approximately by line BB.
but the damage can be concealed with paint if desired. The drawer was removed and made unusable, but the drawer front was cut down to size and replaced on the range front for aesthetic purposes only.

We recommend that eye protection be worn when cutting and bending because the enamel coating is brittle and the cut edges of the metal are sharp. There are usually no electrical connections at the level of the drawer in the conventional cooking range but the appliance should be checked to be sure that this is the case. We suggest that a gap of at least 3 in. be left under the oven as a safety measure to minimize heat transmission to the floor. Finally, it is essential to reinstall the levelling screws because the oven surface must be level and firm.

Use of the Modified Cooking Range

The simple method of reducing the height of a conventional electric cooking range has proven to increase the utility of the appliance for this user. Figure 2 shows the client operating the element controls on the modified cooking range, with the assistance of a commercially available stove knob turner. All the stove element controls are now accessible, making three of the four cooking elements usable. The client can now see the contents in some of the cooking pots and can more easily stir the cooking food. She finds that although opening the oven door is not any easier, reaching the oven racks is. Fire and other hazards due to reaching still exist but have been reduced.

Ovens rely on the circulation of air through the drawer space and up the side panels to minimize heat build-up and to avoid scorching adjacent finishes and flooring. Materials left under or around the stove may impede circulation. It is particularly important not to obstruct the flow of air through the louvers on the back of the oven that cool the wiring. Some early models of self-cleaning ovens that used forced air cooling are not appropriate for this modification.

There may be some situations where such a modification may not be suitable, for example, where there are other stove users who stand. Additionally, this modification may not be an attractive economic choice if commercial labor rates must be paid. The alternative of separate

Figure 2. Client operating element controls on modified cooking range.
countertop cooking and oven units should be considered, but this involves labor costs for installation as well as the purchase cost. Moreover, users become attached to familiar cooking appliances and may be reluctant to change cooking habits.

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References


